

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application. Please amend the claims, as follows:

1. (Currently Amended) ~~A computer-readable medium having stored thereon a data structure for an electronic data element~~ A method of replicating data objects from a source system to a target system, the method comprising:

creating an electronic data element having a first data field containing data

representing an identifier functioning as a link to one or more data objects;

and a second data field containing data representing a state of the

~~identifier in the first data field, wherein the second data field may be one of~~
state of the identifier is set to one of the following states:

a) a first state, in which said electronic data element ~~may be~~
~~accessed~~ is accessible by one or more data object
processing operations and whereby said identifier is
assignable to one or more data objects,

b) a second state, in which said electronic data element ~~may not be~~
~~accessed~~ is not accessible by one or more data object
processing operations and whereby said identifier is
assignable to one or more data objects, ~~or and~~

c) a third state, in which said electronic data element ~~may not be~~
~~accessed~~ is not accessible by one or more data object

processing operations and whereby said identifier is not

assignable to one or more data objects;

setting the state of the identifier to the first state;

setting a shared lock on the electronic data element after the state of the

identifier has been set to the first state;

assigning the identifier to one or more data objects stored in a memory of the

source system;

processing, by one or more data object processing operations, the one or more

data objects assigned to the identifier while the identifier is set to the first

state;

storing, after processing the one or more data objects, the one or more

processed data objects to the memory of the source system;

removing the shared lock from the electronic data element after the one or more

processed data objects have been committed to storage in the memory of

the source system;

changing, after removing the shared lock from the electronic data element, the

state of the identifier to the third state;

setting an exclusive lock on the electronic data element after changing the state

of the identifier to the third state;

replicating, after setting the exclusive lock on the electronic data element, the

one or more processed data objects from the memory in the source

system to a memory in the target system; and

removing the exclusive lock from the electronic data element after replicating the one or more processed data objects from the source system to the target system.

2. (Currently Amended) The ~~computer-readable medium~~ method of claim 1, wherein the first data field and the second data field are located in a table.

3. (Currently Amended) The ~~computer-readable medium~~ method of claim 1, wherein the first data field is a data field in a first table and the second data field is a data field in a second table.

4. (Currently Amended) The ~~computer-readable medium~~ method of claim 1, wherein the electronic data element is implemented in object orientated programming as an instance of a class.

5. (Currently Amended) The ~~computer-readable medium~~ method of claim 1, wherein the ~~data structure~~ electronic data element further comprises a third data field containing data functioning as a flag representative of representing whether the first data field in the electronic data element ~~is the~~ contains a default identifier.

6. (Currently Amended) The ~~computer-readable medium~~ method of claim 1, wherein during a data object processing operation data stored in the second data field is changed from the first state to the second state.

7. (Currently Amended) The ~~computer-readable medium~~method of claim-6_1, wherein ~~during the data processing operation~~ the identifier stored in the first data field is assigned to ~~one or more~~ a plurality of data objects which ~~are stored in the memory of the source system.~~

8. (Currently Amended) The ~~computer-readable medium~~method of claim-7_1, wherein ~~during the data processing operation~~ the identifier state stored in the second filed data field is changed from one of the first and second states to the third state if after the one or more assigned processed data objects are have been committed to storage in the memory of the source system.

9. (Currently Amended) The ~~computer-readable medium~~method of claim-6_1, further comprising:

creating a second electronic data element having:

a fourth data field containing data representing an identifier

functioning as a link to one or more data objects, and

a fifth data field containing data representing a state of the identifier

stored in the fourth data field, wherein the state of the

identifier stored in the fifth data field is set to one of the first,

second, and third states.

~~wherein during the data processing operation a new electronic data element is created and the second field of the new electronic data element is set to the first state.~~

10. (Currently Amended) The ~~computer-readable-medium~~method of claim 9, wherein the ~~data-structure~~ second electronic data element further comprises a ~~third-~~ sixth data field containing data functioning as a flag representing ~~representative of~~ whether ~~the fourth data field in the~~ second electronic data element ~~is the~~ contains a default identifier, ~~and further wherein during the data processing operation the third~~ data field of the new electronic data element is flagged as the default identifier.

11. (Currently Amended) The ~~computer-readable-medium~~method of claim 10, wherein ~~further comprising:~~

changing the data stored in the sixth data field to indicate that the fourth
data field contains the default identifier; and
changing, during the one or more data object processing operations, the
data stored in the second data field of the prior electronic data-
element is set to the second state.

12. (Currently Amended) The ~~computer-readable-medium~~method of claim 10, wherein ~~during the data processing operation-~~ further comprising:

changing the data stored in the sixth data field to indicate that the fourth
data field contains the default identifier;
determining whether the third data field indicates that the first data field
contains the default identifier; and ~~of a previous electronic data-~~
element is examined

changing, in response to determining that the third data field indicates that
the first data field contains the default identifier, and, if the third field
of the previous electronic data element is flagged as the default
identifier, the third- the first data field from the default identifier to an
identifier value other than of the previous electronic data element is-
flagged as not being the default identifier.

13. (Currently Amended) The ~~computer-readable medium~~ method of claim 1,
further comprising:

wherein during a data processing operation that sets a block on the
electronic data element, the second field of the electronic data element is examined and
if the state of the second field of the electronic data element is the first state or the
second state, the data processing operation prevents a change in preventing the state
of the identifier stored in the second data field from being changed to the third state
while the shared lock is set on the electronic data element.

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Currently Amended) The ~~computer-readable medium~~method of claim ~~16~~1, wherein ~~during a data processing operation~~ the electronic data element is shared locked prior to assignment of the ~~electronic data element identifier~~ to a the one or more data objects.

18. (Canceled)

19. (Currently Amended) The ~~computer-readable medium~~method of claim ~~17~~1, wherein ~~during at least one of the data object processing operations~~ examines, the state of the shared lock of the data element is ~~examined~~ prior to assignment of the ~~electronic data element identifier~~ to a the one more data objects.

20. (Currently Amended) The ~~computer-readable medium~~method of claim 1, wherein the source and target systems are subsystems within the same computer system. ~~during a data processing operation the electronic data elements are replicated from a source system to a target system.~~

21. (Currently Amended) The ~~computer-readable medium~~method of claim 1, wherein the identifier of the first data field comprises a globally unique identifier.

22. (Currently Amended) The ~~computer-readable medium~~method of claim 1, wherein the identifier of the first data field comprises a time stamp.

Please add the following new claims 23-25:

23. (New) A data-object replication system, comprising:

a source memory;

a target memory;

a microprocessor coupled to the source and target memories and

programmed to:

create an electronic data element having a first data field containing data representing an identifier functioning as a link to one or more data objects and a second data field containing data representing a state of the identifier, wherein the state of the identifier is set to one of the following states:

a) a first state, in which said electronic data element is

accessible by one or more data object

processing operations and whereby said

identifier is assignable to one or more data

objects,

b) a second state, in which said electronic data

element is not accessible by one or more data

object processing operations and whereby said

identifier is assignable to one or more data

objects, and

c) a third state, in which said electronic data element
is not accessible by one or more data object
processing operations and whereby said
identifier is not assignable to one or more data
objects;

set the state of the identifier to the first state;

set a shared lock on the electronic data element after the state of
the identifier has been set to the first state;

assign the identifier to one or more data objects stored in the
source memory;

process, by one or more data object processing operations, the one
or more data objects assigned to the identifier while the
identifier is set to the first state;

store, after processing the one or more data objects, the one or
more processed data objects to the source memory;

remove the shared lock from the electronic data element after the
one or more processed data objects have been committed to
storage in the source memory;

change, after removing the shared lock from the electronic data
element, the state of the identifier to the third state;

set an exclusive lock on the electronic data element after changing
the state of the identifier to the third state;

replicate, after setting the exclusive lock on the electronic data element, the one or more processed data objects from the source memory to the target memory; and
remove the exclusive lock from the electronic data element after replicating the one or more processed data objects from the source memory to the target memory.

24. (New) A system for replicating data objects from a source system to a target system, the system comprising:

means for creating an electronic data element having a first data field containing data representing an identifier functioning as a link to one or more data objects and a second data field containing data representing a state of the identifier, wherein the state of the identifier is set to one of the following states:

- a) a first state, in which said electronic data element is accessible by one or more data object processing operations and whereby said identifier is assignable to one or more data objects,
- b) a second state, in which said electronic data element is not accessible by one or more data object processing operations and whereby said identifier is assignable to one or more data objects, and

c) a third state, in which said electronic data element is not
accessible by one or more data object processing operations
and whereby said identifier is not assignable to one or more
data objects;

means for setting the state of the identifier to the first state;

means for setting a shared lock on the electronic data element after the state of
the identifier has been set to the first state;

means for assigning the identifier to one or more data objects stored in a memory
of the source system;

means for processing, by one or more data object processing operations, the one
or more data objects assigned to the identifier while the identifier is set to
the first state;

means for storing, after processing the one or more data objects, the one or
more processed data objects to the memory of the source system;

means for removing the shared lock from the electronic data element after the
one or more processed data objects have been committed to storage in
the memory of the source system;

means for changing, after removing the shared lock from the electronic data
element, the state of the identifier to the third state;

means for setting an exclusive lock on the electronic data element after changing
the state of the identifier to the third state;

means for replicating, after setting the exclusive lock on the electronic data element, the one or more processed data objects from the memory in the source system to a memory in the target system; and

means for removing the exclusive lock from the electronic data element after replicating the one or more processed data objects from the source system to the target system.

25. (New) A computer-readable medium storing instructions for execution by a processor for performing a method of replicating data objects from a source system to a target system, the method comprising:

creating an electronic data element having a first data field containing data representing an identifier functioning as a link to one or more data objects and a second data field containing data representing a state of the identifier, wherein the state of the identifier is set to one of the following states:

a) a first state, in which said electronic data element is accessible by one or more data object processing operations and whereby said identifier is assignable to one or more data objects,

b) a second state, in which said electronic data element is not accessible by one or more data object processing operations and whereby said identifier is assignable to one or more data objects, and

c) a third state, in which said electronic data element is not
accessible by one or more data object processing operations
and whereby said identifier is not assignable to one or more
data objects;
setting the state of the identifier to the first state;
setting a shared lock on the electronic data element after the state of the
identifier has been set to the first state;
assigning the identifier to one or more data objects stored in a memory of the
source system;
processing, by one or more data object processing operations, the one or more
data objects assigned to the identifier while the identifier is set to the first
state;
storing, after processing the one or more data objects, the one or more
processed data objects to the memory of the source system;
removing the shared lock from the electronic data element after the one or more
processed data objects have been committed to storage in the memory of
the source system;
changing, after removing the shared lock from the electronic data element, the
state of the identifier to the third state;
setting an exclusive lock on the electronic data element after changing the state
of the identifier to the third state;

replicating, after setting the exclusive lock on the electronic data element, the
one or more processed data objects from the memory in the source
system to a memory in the target system; and
removing the exclusive lock from the electronic data element after replicating the
one or more processed data objects from the source system to the target
system.